



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE THEORY AND LIMITATIONS OF INTROSPECTION

By RAYMOND DODGE, Wesleyan University

I suppose that no reputable scientist would venture to publish any considerable alleged discovery in the physical sciences without a careful investigation of his instruments under the precise conditions under which they were used. His statement of instrumental variability, latency, and constant errors would constitute data for a scientific evaluation both of his technique and of his experimental results.

In some directions at least, psychology has been as conscientious in matters of technique as any of the biological sciences. In the investigations of sense perception, for example, of memory, reaction, and the Weber-Fechner law, it has criticized its technique and calibrated its instruments, not infrequently with tedious attention to details.

In view of such evidences of scientific conscience will it not seem all the more surprising to the future historian of science that psychology still uses its most fundamental instrument with a jealous, insistent confidence in its universal applicability and adequacy which approaches dogmatism?

To be sure psychology has not been without its chastening experiences. Theoretical discussions are not wanting from Comte to Möbius which point out the fallaciousness of all introspection and the consequent "hopelessness of all empirical psychology." In a more hopeful, and probably also in a more scientific spirit, specific errors and sources of error have been pointed out, and concrete rules for introspection have been formulated. But, in by far the largest number of introspective investigations, all account of the theoretical applicability and consequent limitations of introspection with respect to the problem at hand is conspicuously lacking. The most notable recent exception to this rule with which I am acquainted, is the recent *Ergänzungsband* of the *Zeitschrift* by Müller.¹ In contrast to this model of critical introspective technique, some of the studies in which introspection has been

¹ *Zeitschrift für Psychologie. Ergänzungsband* V, 1911.

pushed farthest seem to approach the limit of uncritical procedure.

Undoubtedly, a complete systematic investigation of the relative reliability of introspection in the various lines of psychological investigation would be difficult. Perhaps it would be impossible. In general, I suppose that the reliability of any one method must be expressed in terms of another. Mere variability is not conclusive unless we have some means of proving that the phenomena themselves are really invariants. Introspection has the peculiar fortune or misfortune that the precise phenomena which it mediates are given in no other way.

Even if a test of relative reliability were possible, it might well be questioned what is the use of trying to measure the value of the only available method. If we are utterly dependent on it why not simply accept it? The objection is not entirely imaginary. It represents a traditional attitude.

The question of possibility can only be answered by the attempt. If the thing is worth while let us go as far as we can.

To the question whether it is worth while my answer seems obvious enough. If there is any way of estimating the probable error of introspection under various conditions, or any way of discovering its theoretical limitations, two real scientific advances will have been made; we shall have some measure of the relative certainty and finality of alleged introspective facts, and we shall have the stimulus that comes with a consciousness of our limitations.

The occasional fallibility of introspection is no new heresy. Concrete contradictions in the introspections of different observers, the limitations of individualism and the impossibility of subjecting the facts of introspection to mathematical formulation in any other way, led to the adoption of experimental conditions. This was the guiding principle of the "new psychology." Psychology has indeed changed both in content and in method since the days of its complete bondage to philosophy. I believe it still promises growth.

Gradually increasing knowledge of the anatomy and physiology of the nervous system, and of the interdependence between neuroses and psychoses, forced psychology into a quasi-alliance with physiology. Up to the present time however, it is conspicuous that the two books—physiology of the nervous system on the one hand, and analytical psychology on the other—have but scant relationship. The splendid illustrations of histological preparations to which the novice

must still accustom himself in psychological text-books function chiefly by their impressiveness. Nervous anatomy and physiology have raised more questions in psychology than they have answered. But persistent inquiry into the physiological conditions of consciousness is conspicuously lacking. On the basis of a postulated parallelism, psychologists have chiefly been content to state the facts in both series, confuse the terminology a little, and leave the detailed correlation to the uncontrolled imagination.

Recent rapid growth of exact information in allied fields of medicine and general physiology finds even less place for itself in orthodox introspective psychology. Though for some of us, it stimulates a persistent belief in the possibility of coördination and unification.

But it is the lack of unity and scientific coherence in the stuff of contemporary psychology, the growing gaps between the different lines of investigation, and the inhospitality of introspective psychology to non-introspective facts however closely related, that raise the methodological question. They emphasize the need of every growing science that, from time to time, it give its postulates and its methods careful scrutiny. If introspective facts are the only mental reality, then our course is clear and relatively simple. If, on the other hand, there are any other real indicators of the mental life, then, in my opinion, we not only miss our opportunities when we refuse to use them, but we make ourselves ridiculous by our inability to emancipate ourselves from philosophical tradition.

After all then, it is the professed dogmatic intolerance of introspective psychology that forced me to methodological discussion. In spite of many vigorous protests, it still seems orthodox to regard introspection as the only true psychological method, equally adequate for every psychological inquiry. In spite of the long list of those who have contended for the possibility of unconscious mental reality, our dominating tradition is the dualistic dogma that that alone is mental reality which is given in introspection. All other facts, however closely related, are physical or physiological. Psychologists as far removed from each other as Lipps and Titchener agree in the fundamental assumption that non-introspective facts are non-psychological. Even when as in some recent text-books behavior is recognized and even emphasized in psychological method, its function still seems to be to indicate the existence of introspectively discoverable facts.

In this view of the case, the direct experimental formulation of a problem of mental organization, like mental fatigue,

as a problem of organic life is a methodological absurdity. The only legitimated functions of experiment are either to provide suitable conditions for introspection, or objectively to lead to the presumption that adequate introspection of the subject would reveal something. Failure to introspect condemns an investigation to the outer darkness of physiology. Facts of nervous action may be interesting or even suggestive but "psychology better take them from the physiologist." In public conference not long ago it was seriously questioned whether titles in nervous anatomy and physiology couldn't well be omitted from the Psychological Index.

Against this dogmatic dualism of science it is the business of this paper to make earnest protest. One may have patience with parallelism as a working hypothesis even though one believes it to be both useless and misleading. But when the working hypothesis disguise really covers a dogmatic ontology, then it ceases to be scientific or even honest.

It may be that after all it were better to surrender the name psychology to those who believe that it applies only to a description of the findings of introspective consciousness. If so then let us candidly confess allegiance to another science—a science of the conditions of human experience, conduct and personality. It will be a true science in that it will investigate the totality of the conditions of the phenomena with which it deals. Rather than haggle about its source, it will welcome every real indicator. Every fact that may throw light on conduct, experience, or personality whether from pathology, neurology, introspection, or the behavior of animals will find itself at home, not merely a stranger's welcome.

Personally I believe that the proper name for such a science is psychology, the science of the highest principle of organization of human life. A name which only comparatively recently in the history of science has been appropriated for a small group of important relevant facts which sadly needed straightening out and systematizing, but which of themselves neither constituted a science, nor found any need of a soul. It is difficult to see why they insist on the name.

It is my belief that an adequate critique of the theory of introspection will show that non-introspective evidence is not only legitimate in certain directions; but that, if obvious limitations of introspection are to be transcended, it is a necessary complement to introspection. It will be a later task to show that such relevant evidence exists in connection with mental work and mental fatigue.

The Problems of Introspection

Notwithstanding the arraignment of Comte, there is no serious inclination among contemporary scientists, as far as I know, to deny the possibility of introspection. Apparently each of us is aware in a very direct and convincing way of sequences and coexistences of mental facts, and of certain differences and similarities between them. Probably most psychologists would go further. With the aid of experiment, the rise and development of a conscious fact may be said to be an *observable* experience. It is just as real and just as truly observable as the development of an embryo. Observation interferes with one no more than it does with the other.

Furthermore there is no real difference among psychologists concerning the importance of introspection. The reality of introspection and its "radical" importance in any science of human experience are indisputable.

But introspection is not only a method of psychological investigation, it is also a mental fact, and as such it must be capable of psychological analysis and investigation.

Quite apart, then, from epistemological questions, which can only confuse the issue, the fundamental psychological problem with respect to introspection is to understand it as a mental fact.

The second problem is; how far into the nature of the various other mental processes can such an instrument be expected to penetrate?

A third problem will as a matter of fact eventually grow out of our answer to the second, viz., the old problem of supplementing introspective experience where its data are not unimpeachable, or where it raises questions that it cannot directly answer.

Theory of Introspection

There seem to be two main types of tradition with respect to introspection. The oldest and most widely held is dogmatic introspective realism. Beginning early in ancient philosophy it served as postulate equally for the most various pre-Kantian philosophies. The Cartesians, the English Empiricists and the Continental Sensationalists, however they differed with respect to the origin and validity of our knowledge of an external world, and however divergent their deductions, all agreed that knowledge of our own mental life was immediate and adequate. To think and to be aware that we think was one and the same process. The existence

of any real mental fact which was not evident in self-consciousness was consequently inconceivable. If, as thinking substance, we do not know how we move our arm, it follows self-evidently for Geulincx that some other being must do it for us. The act is none of ours.

Across the channel the principle led to the denial of innate principles. Its logical conclusion was the denial of soul itself. We never come upon it in our most exhaustive introspections.

Only when the problem of the gap between the knower and the known became an inner problem of the monad do we find a toleration of non-introspectable mental facts. For the monad, whose being consists in perception, the failure to realize that it is perceiving must be explained by some difference in its perceptions. But it was in conjunction with this admission of imperceptible perceptions that introspective realism reached its highest pre-Kantian formulation. For Leibnitz all reality is fundamentally of the same kind that is given to us directly in introspection.

First in Tetens and Kant do we find a clear consciousness that the inner perception like the outer gives us only phenomena. But introspective realism persisted in post-Kantian philosophy. And in spite of a habit of speech by which most of us as a matter of course speak of mental phenomena,² introspective realism is still dominant in modern psychology.

Now for the thoroughgoing introspective realists, I suppose that there is no introspective problem at all. They are immediately aware each of his own mental world. What each knows of himself is ultimate reality, since in his particular case, knowing and known are identical and identity leaves no room for discrepancies. To be sure the inter-subjective discrepancies in alleged introspective facts, the gradual growth of an introspective technique, and the obvious epistemological difficulties in substituting feeling or willing for knowing in the identical proposition, might well arouse the realist's suspicions. But it is simpler to regard the discrepancies as accidents, or to limit mentality to the intellect. Unfortunately realism and phenomenalism seem to be subject to the physiological "all or none law."

But it was in the critical discussions of introspective phenomenalism that there arose a new and insistent problem, the psychological problem of the inner sense, viz., How does mind perceive itself?

The various physical stimuli and the peculiarities of the

² BRENTANO, *Psychologie* p. 10 fol. defends the use of the terms mental phenomena entirely without metaphysical implications.

different sense organs seemed to account for the qualitative differences in sensation. The elaboration of the sense material into experience depended on central conditions, sense forms, the categories, and in general the organized residua of past experience.

For the inner sense on the contrary there was no obvious sense mechanism. No inner eye explored the inner horizon. No inner touch brought them in contact with themselves.

Within the Aristotelian tradition that sensation is a being moved, a being impressed, a *vis passiva*, the introspective problem naturally took the form: How can mind impress itself? How can it be at once mover and moved? impressor and impressed, active and passive? The simplest answer was negative. But to say it can't is to ignore the facts. We can and do introspect.

One may point out in passing, that an inner sensory mechanism would not be very valuable if we had it. If the miracle of transforming physical energy into consciousness has once taken place, there would be no function for an inner sense mechanism. There would be nothing to transform. It would be of no special service to the physiologist since his problems need finer tools than any organs we would likely be endowed with. In practical life on the other hand, it would be a distinct disadvantage. Additional facilities in introspection would doubtless as Kant suggests turn humanity into a race of hypochondriacs. There are enough tendencies in that direction as it is.

I suppose it is to Leibnitz on the Continent and to Berkeley in England that we really owe the modern protest against the passivity of perception. The monads have no windows. Visual facts are only signs for the perception of space. But in our more immediate psychological tradition, it was the Herbartian doctrine of apperception which, in spite of its unsatisfactory assumption of energizing ideas, first put the theory of perception on a permanent basis.

It is now pretty generally accepted that, however we may view the abstract sensation, every complete process of perception is an active process. Perception always involves factors from past experience. Systems of organized residua, the apperceptive masses of Herbartian terminology, are the conspicuous conditions of a unified experience. They emphasize, modify, complete, distort and select from possible sense material.

Every adequate sense stimulation arouses these residua of past experience. It fuses with some into the percept.

It associates itself with others in various systematic ways so that every percept comes to consciousness in a complex setting—as a member of temporal, spatial, causal, and meaning systems. If the stimulation occurs in sleep and arouses no residua of past experience there is no consciousness at all.

Now while the inner sense lacks every vestige of a sense organ, the apperceptive elaboration represents a side of the perceptive process that is available for the inner sense as well as for the outer. In introspection to be sure the apperceptive systems are peculiarly selected. But if the proper apperceptive systems are granted, it is obviously as easy to integrate a fact of consciousness with other similar facts into an inner experience as to integrate it with motor and sensory factors into spatial position and causal relationships. The differentia of a physical fact is its objectification in a world of extended things. This has found various expression. As the Cartesians put it, the essence of body is extension. As Kant expressed it, the form of the external sense is space. The differentia of the facts of psychology is that they are regarded as “having place in or being part of some one’s consciousness or experience.”³

That is they differ from the physical facts entirely in their noetic setting, not in the stuff.

That this is a valid account of the process of introspection may appear from a description of a concrete instance. If I have a given percept say a vase, perception itself places it directly in spatial relationships with an external world of things. I perceive it at such a distance, of such a shape, and size, beautiful or ugly. More remotely it is known as new or familiar, as having a certain function, and value, as having certain physical and chemical properties, etc. When these various classifications are complete I shall have apprehended the vase in all its objective relationships as a part of my objectified experience of a world of things. But any part of the above processes may also be the object of introspection. The process I would apprehend introspectively doesn’t change; that is, under the simplest ideal conditions it doesn’t. What do change are the apperceiving noetic systems. They no longer relate to position, size, use, and history, but to the inner complication and sequence of experience. Since the object in the two series may remain identical the difference between psychology and physics is not a different stuff, but a different group of relationships.

³ WARD, *Encyclopaedia Britannica*, Ed. 11.

To be sure the stuff may also change but differences of stuff are not necessary.

Brentano insists that the object of psychology is presentation as process, while the object of physics is the presentation result. If we attempt to reduce this difference to psychological terms it seems doubtful if we can distinguish directly between the idea as process and the idea as result in any other way than the one I have pointed out.

In an analogous way observation of the same identical physical fact, for example the fall of an apple, yields data for the various scientific disciplines according to the various systematic groupings of experience with which it happens to integrate. If it integrates with any of the systematic groupings of experience itself, it yields data for a science of experience as such.

Use of the term self-perception is misleading if it suggests any necessarily peculiar object of regard that may be perceived only by an internal sense, or if it suggests a division of the self into observed and observing, different from that which occurs in every moment of attentive observation.

Neither the stuff of introspection nor its methods are unique. The differentia of a science of experience is that as a group of organized experience the lines of similarity and difference along which the organization is effected involve an abstraction from the spatial attributes of experience.

An experimental test of the validity of this account of introspection seems to be impossible. If the theory is true every attempted experimental test of it would involve predetermined apperceptive factors, which would approximately correspond with the sum total of the experimenter's past experience and philosophic prejudices concerning the matter. As an experiment in introspection it would prove nothing except the experimenter's attitude to the problem.

If this psychological account is true, however, the history of introspective psychology should furnish evidence at every step that the introspective process was determined by the available apperceptive systems. It should show this both in the development of the individual psychologist and in the development of introspective schools or fashions.

The training of an introspective psychologist seems to be no less exacting than the training of an observer in natural history. Neither is born ready-made. Both require a certain amount of practice. Both observe better the more complete

their information is about what they are to observe. The fundamental rules to avoid prejudice, inference, and the infusion of affection are alike for both. Even though his material is supposed to be given to him directly, a beginner's observations in psychology are as useless as in histology.

He observes what he is acquainted with or thinks that he is acquainted with. Most of it is trivial. The really important matters he overlooks until his attention is called to them; i.e., until he has developed adequate apperceptive systems.

Even the trained introspectionists are liable to error. Few psychologists now-a-days are content with analyses "am grünen Tisch." Lipp's "pure" psychological experiments are commonly only the preliminaries for carefully planned experimental modifications of the determinable conditions. Every trained psychologist is aware of the insidious outcrops of expectation and interest, of the effects of suggestion and leading question, of the tendency to find what the instructor or the theory demands. At least in our pupils we are aware of all these things. The history of psychology shows that they are universal.

Just now we are struggling with an illuminating question in the problem of imageless thought. More than once it has been pointed out that the individual's answer to the question depends largely on the school in which he was trained; i.e., on the categories and schemes with which he happens to be equipped. Imageless thinkers, on the other hand, find considerable difficulty in naming their categories and in describing their experiences in positive terms without reference to sense imagery. If they really do find imageless experience, most of us clearly lack the appropriate apperceptive systems. At the heart of the matter I believe the real problem is not whether a given observer always finds sensory factors in the analysis of all his mental experience, but how any observer with the usual training could avoid finding them, whether they were necessary parts of that experience or not.

The facts can doubtless be seen with less emotional disturbance in temporal perspective. But enough, the history of psychology shows exactly the same dependence of observation on its apperceptive systems that is seen in the natural sciences or in practical affairs. I fear I have been guilty of proving the obvious. But if so there is all the less reason for us to hesitate in the conclusions.

The Limitations of Introspection

An adequate theory of introspection should furnish a unifying principle of those empirical rules by which the more conscientious introspectionists have governed their practice. It should also indicate the origin of those disturbing individual differences in introspection that more than any other one factor prevent us from speaking of a science of introspective psychology.

Both of these deductions from our theory of introspection are eminently practicable if this were the proper occasion for them. What is more to our present purpose, an adequate theory of introspection should also enable us to estimate the kind and amount of information that may be expected from it. This was our second problem. Let me put the main issues concisely in the form of hypothetical questions.

If for the sake of argument consciousness should be supposed to be a kind of organization of what is otherwise non-conscious except in its potentialities, could introspection as we have learned to know it ever give us directly either the unorganized elements or the process of their organization? Would not inquiry concerning these facts, however, be both a legitimate and a necessary part of any science of such organic life?

If mental life should for the sake of argument be supposed to be extremely complex, so that each moment of consciousness involved n factors in various grades of clearness, would any more of the total complex be directly observable by introspection than could in turn be cleared in consciousness through the arousal of appropriate apperceptive systems for the successive integration of the complex, part by part?

Conversely, if introspection at any moment found only one, or relatively few, or only one kind of elements in consciousness, would that constitute evidence that the actual facts of mental life were simple, or might it not be that internal vision was limited by the limitations of our instrument?

If consciousness itself, for the sake of argument, should be regarded as a process of integration, could the process itself ever get integrated in terms of its resultants? Would not an introspective psychology forever be doomed to blindness with respect to the dynamic reality?

Perhaps all of the hypothetical antecedents are contrary to fact. That is beside the point. They are all possible as far at least as any legitimate scientific presupposition is concerned. No scientific method has the right to start arbitrarily with

the assumption that they are all wrong. Their truth or falsehood must be regarded as a matter of fact. Our conviction should not be based on philosophical prejudice but on whatever evidence we can obtain.

Some of the limitations of introspection as a tool for investigating the mental life are finding ample confirmation in the disclosures of those apparently large and relatively important fields of the "sub-conscious." Many of us dislike the term with cause. It seems to stand for a mass of unscientific speculation. At best it says too much. Personally, I prefer the word "uncleared"⁴—which merely states the facts and leaves the implications for science and not for speculation. "Uncleared" mental facts may be conscious or sub-conscious or unconscious. Their generic characteristic is that in some way or other they fail of having been taken up in the introspective integration. Some of the facts that are uncleared in one moment of consciousness become cleared in the next. Some of them have waited long for adequate integrative systems. Some are perhaps by their very nature eternally condemned to obscurity. The dependence of the clearing process on the available integrative systems emphasizes the value of direct experiment, of the unusual, the exaggerated, and the striking. Even the purely physiological and the pathological may indicate new lines of cleavage.

Even under the most favorable circumstances it would seem to be theoretically impossible for introspection to disclose the elements of consciousness. The current doctrine of sensation might seem to disprove this. But sensations as introspective psychical elements are rank pretenders. A simple sensation is of course utterly undiscoverable by any process of introspection. Certain abstract qualities of consciousness, as we know it in introspection, have in the course of scientific progress become hypostatized and unified as sensations. But when it is held that the attributes of sensation include quality, duration, extensity, and intensity; and I would add consciousness of their reality as part of personal experience, with an indefinite number of relationships to the rest of experience—it seems absurd to regard the observable sensations as elemental.

On the contrary, the real elements, in the sense of the stuff of which consciousness is composed, must forever be in-

⁴ An Experimental Study of Visual Fixation, Chaps. II and III, *Psy. Rev. Monographs*, No. 35.

accessible to introspection, since in introspection we can only find completed consciousness.

This may not seem very serious, but it forces the question: If we would discover the stuff out of which consciousness is made, where will we seek it? Perhaps we may come closer to it in the physico-chemical constructs of biology than in the sensations of psychology. At least the former have as much claim to our attention as any introspective fact.

Furthermore, introspection seems incapable of disclosing the apperceptive masses on which any given moment of awareness depends. One or two aspects it may pick up and bring to the focus of consciousness. A few may in turn be apperceived, but the great bulk must remain forever uncleared.

We can never hope that the conditions of consciousness will be disclosed in consciousness. C. in moment 2 may discover some of the conditions of C. in moment 1. But that will be by retrospective analysis and inference and not because C. in any moment perceived its conditions.

Introspection has never been able to fill out the causal relations of any fact of consciousness, or to complete a statement of its conditions. The rise of an idea is always something of a miracle. After it has come we can find some premonitions of it in antecedent consciousness. But the same discoverable antecedents may to-morrow give rise to a totally different effect. How any particular concept was synthesized we cannot tell by introspection. We have never discovered the welding process. We have never traced the steps of manufacture. The feeling of inspiration that commonly accompanies ideas of sufficient impressiveness seems to be a phenomenal correlate of the hiatus of introspection.

Finally the psychical dispositions, psychophysical or physiological residua, engrams, or whatever we may for convenience call them, are never directly accessible. Only by construction do we know any thing at all of residua. Yet even the most ardent introspectionist would hardly deny that our knowledge of memory and the rate of forgetting belongs to psychology.

But perhaps it will be claimed that all the inaccessible depths of the uncleared are of the same nature as the accessible, just deeper water that our sounding lines will not quite reach. I believe that the evidence is against it: The subconscious, the elements of consciousness, the processes of their integration, and the residua of past experience differ from consciousness in one very significant fact that they are

not describable in terms of introspective categories, except negatively. As far as I can see there is no reason to suppose that a scientific construct in psychology will be any more like the facts of simple observation than the scientific constructs in physics are like the simple facts of observation. I can see no reason for believing that introspection guarantees any closer approximation to the concept that embodies the summary of all the available indicators than does sense perception.

Finally, self observation, as a means of analysis of consciousness, or as the basis of a description of the complex whole, regularly and inevitably contaminates the results. More than once in the history of chemistry, supposed traces of various elements have been reduced to ingredients of the vessels used. Modern chemistry makes an entirely justifiable demand that every analysis must rigidly exclude the possibility of introducing its findings in its technique.

Now unfortunately in introspection the instrument may contain everything that can appear in the analysis. Nay more, it must contain everything that the analysis can discover. If a factor is expected, it is *ipso facto* in consciousness. No amount of scientific caution can separate entirely the observed fact from its apperceptive masses. Even if one conjectures that a factor will not appear, its subsequent appearance will not be entirely free from the possibility of error. To have been considered at all is to have been in consciousness and consequently easily revivable. The difficulty is inherent in the psychology of observation. Good observers must be trained—trained to look for certain specific things. Psychological observation offers no exception to the rule. No psychological scheme has been too absurd to be supported by introspection. It shows fashions like hysteria and the delusions of the insane. Even the fundamental categories of consciousness change with the years, while new and previously totally unsuspected facts may be readily introspected as soon as there is theoretical ground for belief that they exist.

On these considerations the methodological dogma that all mental reality is subjectively observable and conversely that the subjectively observable alone is mental reality seems to me utterly unjustifiable. Moreover, analogy of the successful empirical sciences is opposed to it.

To be sure, as Titchener insists, every natural science picks out some specific group of phenomena for investigation. Let us take sound for example. Within the limits of direct obser-

vation physics describes the phenomena of sound. But what would be our science of sound if we expurgated everything that wasn't directly an auditory experience? Sound waves for example are never directly observable. But how absurd it would be to insist that they are metaphysical or non-physical because they are not a direct part of that group of phenomena with which acoustics deals. To be sure we have no sense organs fitted for their perception. But experiments are readily devised to demonstrate their existence. The experiment doesn't make them audible otherwise than as sound. It doesn't even make them feelable or visible. It adjusts its technique so that visible and feelable facts shall become reliable indicators not only of the existence but of the character of the reality that we can never hope to know directly except as sound. It is a wonder the metaphysician never hit on the expedient of a visual-auditory parallelism. He probably would if physics had allowed itself to be invaded by the high a priori road as psychology has been.

It may be objected that the only reality in acoustics is sound and that the rhythmic displacement of visible particles isn't sound at all. The only possible answer is affirmative. But we must go one step farther and assert that in the scientific effort to apprehend reality all real indicators are significant. The direct sensory facts have no peculiar claim even in physics. Is the mechanism of the inner sense so much more reliable and adequate than that of the outer senses that it alone gives us things as they are, or spares us the necessity of scientific construction?

If in practice or in fatigue experiments, certain mental processes are found to be correlated, I believe that is as valid an indication of mental fact as the most elaborately controlled introspection. If there is experimental evidence that certain mental capacities suffer measurable objective change, I believe that is just as truly a psychological fact as anything that is discovered by introspection. Indeed, in this case at least, the objective method will be far more reliable.

The danger of this position is that it seems to open the door for that kind of metaphysical constructions that psychology has been centuries in freeing itself from. The danger is a real one, but it is not peculiar to psychology. In this direction at least, I believe it is our duty to make the break with philosophy clean cut and complete. Psychology as special science has no right to metaphysical constructs. Her constructs must be her own. They must be scientific constructs in the narrowest sense of the word. And it is the

manifest duty of those who are interested in psychology as a special science to scrutinize every hypothesis that enters the fabric of their thinking and criticize them by scientific canons.

In view of all the evidence I believe that introspection is only one of the indicators of mental reality. It is a real and important indicator of peculiar value in special fields but it is only one of many. Equally real I believe is every pathological or neurological fact, every result of practice, training or fatigue that throws any light on mental capacity, mental organization, or mental defects.